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ABSTRACT

A study was conducted to determine whether participation in a summer bridge program influenced students' locus of control and improved their performance in community college. A comparison was made between two groups of full-time student participants in a state-supported academic and financial aid program for disadvantaged students with incomes below $12,000. One group of these Educational Opportunity Fund (EOF) students attended a six-week summer bridge program, consisting of remedial courses, college orientation, counseling, and achievement motivation activities, before attending one of five community colleges. The control group did not attend the bridge program. The original sample consisted of 155 randomly selected EOF freshmen between the ages of 17 and 46. The majority (52%) were Black, 25% were White, 14% Puerto Rican, 6% other Hispanic, and 3% other minority students. The final sample consisted of 100 subjects since 55 of the original 155 left college before the end of the fall semester. All these students were pretested prior to the summer bridge program and post-tested after one semester for basic skills and locus of control. Credits attained and cumulative grade point average (GPA) were also used as measures of achievement. Study findings included the following: (1) there were no differences between the bridge and non-bridge students in terms of changes in locus of control, achievement in basic skills, and GPA; (2) Black bridge students earned the highest number of mean credits, and male bridge students were the most successful in terms of both GPA and credit earned; (3) bridge students significantly increased their reading comprehension, essay, and algebra test scores on the post-tests; (4) 92% of the bridge students felt more in control of their environment after one semester, with those aged 31 and above the most inclined toward personal control. (WJT)

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A COMPARISON OF LOCUS OF CONTROL AND ACHIEVEMENT AMONG REMEDIAL SUMMER BRIDGE AND NONBRIDGE STUDENTS IN COMMUNITY COLLEGES IN NEW JERSEY

by

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Introduction

The problem of college student attrition has been an interest to researchers and college administrators for many years. Decline in the college age population, which had been anticipated for some time, and the recent decline in the college going rate of Black and Hispanic students has brought a sense of urgency to the examination of this problem (Commission on Minority Participation in American Life, 1988; Education Week, 1988).

Extensive longitudinal studies of college dropouts have identified student characteristics (e.g. socioeconomic status, high school preparation, ability, educational aspirations) and institutional characteristics (e.g. type of college, size of college, selectivity faculty-student interaction) which are associated with attrition. These studies have also indicated that ethnicity has a significant relationship to attrition. Black college students and Native Americans have a higher probability of dropping out of college than whites; and of all ethnic minorities, Hispanics have the lowest probability of graduating from college (Astin, 1982; Institute for the Study of Educational Policy, 1978; Lenning, Beal, & Sauer, 1980).

Minority student retention is particularly important to college leaders because demographic predictions indicated that after the year 2000 minorities will be a major proportion of the college enrollment pool and the predominant source of labor for the American economy. Community colleges are the primary access to higher education for minorities. In comparison to four year colleges which enroll 15% of minorities, two year community colleges account for 21% of minority enrollment nationwide (ACE, 1986). If community colleges continue to be a major source of minority college graduates, it will be incumbent on these institutions to develop effective strategies that will encourage students to overcome their disadvantages so that they can successfully complete their colleges studies and pursue careers in emerging as well as traditional fields.

To retain minority students and students who enter college with less than adequate academic preparation, collegiate institutions have developed special academic support programs and retention strategies. According to Grant and Hoeber (1978), pre-college programs were the most prevalent basic skills and developmental education programs during the 1970s. Summer bridge programs continue to be the most frequently identified by institutions as specially designed to increase the persistence and retention of underprepared freshmen (Beal & Noel, 1980; Lenning, Beal & Sauer, 1980; Ramist, 1981). Moreover, the summer bridge program has been reported as a successful academic intervention which improves the retention and persistence of disadvantaged students (Bengis, 1986; Carmichael, 1982; Myers & Drevlow, 1982; Smith, 1986).

Some of the programs reported test score gains of several grade levels (Arcuri, Daly & Mercado, 1982; Carmichael, 1982; Farrow, 1980; Fitts, 1979; Kling, 1972). One program reported no significant difference in academic performance (Williams, 1984). Others reported that bridge students were able to take college level courses the first semester, or were retained after one year (Bengis, 1984a, 1984b; Crist, 1980; Farrow, 1980; Fitts, 1979; Myers & Drevlow, 1982). This study sought to affirm the strong relationship between locus of control and achievement reported by other investigators and to note academic achievement resulting from summer program participation which provides an opportunity for change in locus of control.

Though brief in duration (four to eight weeks), summer bridge programs have featured a variety of retention strategies. Students are usually tested to determine their academic weaknesses, then provided with counseling, tutoring, instruction, college orientation and other coordinated activities in an environment designed to stimulate achievement and personal growth. Summer bridge programs typically have attracted and recruited young adults who have recently graduated from high school. Increasingly, in community colleges, mature returning adults have also participated in summer bridge programs to ease their re-entry to academic study.

The focus of this study was to determine whether participation in a summer bridge program influences students' locus of control orientation and improves their academic performance in college. A comparison was made between the locus of control and achievement of EOF (Educational Opportunity Fund) students who attended a summer bridge program and those who did not attend a summer bridge program.

Theoretical Rationale:

The Locus of Control Construct and Achievement

The personality characteristics of poor self-concept, lack of motivation, and low aspiration have been investigated as effects upon the academic achievement and retention of the disadvantaged for two decades. One variable which has been found to have particular bearing upon academic achievement is the construct of internal-external locus of control. The discussion which follows will examine this construct and the research findings that bear upon the design of educational programs for academic improvement and retention of minorities and the disadvantaged.

Prior to the 1950s, below average intelligence as measured by intelligence tests, was presumed to be the cause of poor academic achievement. During the fifties, research by McClelland (1951) and Atkinson (1964) on the achievement motive directed attention to variables which intelligence tests were not measuring, such as motivation and individual differences. The social upheaval of the sixties and particularly the Coleman Report drew attention to differences in achievement due to ethnicity (Lefcourt, 1976).

Coleman and his associates were the earliest to pinpoint a high

correlation between achievement and perception of control over the environment. In writing about these findings, Coleman and his team of investigators reported that:

For children from disadvantaged groups, achievement or lack of achievement appears closely related to what they believe about their environment...children from disadvantaged groups...in many cases assume that nothing they will do can affect the environment--it will give benefits or withhold them but not as a consequence of their own action. (p.321)

They further concluded that:

"It may well be, then, that one of the keys toward success for minorities which have experienced disadvantage and a particularly unresponsive environment--either in the home or the larger society--is change in this conception. (p.321)

Their conclusions have been supported by more recent studies (Bar-tal & Zohar, 1977; Garner & Cole, 1986; Nowicki & Strickland, 1973).

Locus of control, as posited by Rotter's (1954) social learning theory, is a generalized expectancy of control or lack of control, as a result of positive or negative reinforcement. Individuals with an expectancy of internal control perceive life's outcomes as within their control and the result of their own actions. Individuals with an expectancy of external control assume that outcomes are the result of luck, fate or powerful others. Hence, internals will take responsibility for their failures and successes and will attempt to cope and to exert control over compelling situations. Externals assume a helpless and fatalistic perspective and feel they are unable to change their circumstances. Lefcourt (1976) has characterized locus of control as not a dichotomy, but as a process or tendency. Indeed the research indicates that individuals can change their locus of control at varying stages in their lives.

In Lefcourt's (1976) review of research on locus of control, he reported several studies that suggest that academic achievement is related to the subject's perception of personal control. In a similar review, Joe (1971) reported that "Earlier studies have shown that internals spent more time in intellectual activities, exhibited more intense interest in academic pursuits, and scored higher on intelligence tests and other academic tests than externals" (p.627). More recently, Cole (1984) reported that academic achievement is significantly related to locus of control and field dependence, and Garner and Cole (1986) proposed that locus of control provides the basis for motivation to achieve.

Several investigators, Duke and Nowicki (1974), Foster and Gade (1973), and Kaiser (1975) studied the correlation between locus of control and achievement of college-age subjects. They concluded that there is a significant relationship between behavior and locus of control. Roueche and Mink (1982) found the locus of control concept very useful in assessing the behavior of nontraditional college students and proposed counseling intervention techniques to reverse

"learned helplessness" among students in open access programs.

According to Bar-Tal and Bar-Zohar (1977) a number of studies indicate there is a positive relationship between locus of control and achievement. Of the 36 studies that Bar-Tal and Bar-Zohar reviewed, 31 suggested that persons with an internal perception tend to have a higher level of academic achievement. One study indicated a negative relationship and four found no significant relationship between locus of control and achievement. Bar-Tal and his associate have noted that if locus of control is partly determined by environmental factors, then it is possible to change locus of control by changing the educational environment. They cited studies which demonstrated that subjects in educational programs for the disadvantaged became more internal in their perceptions and improved their academic achievement.

The Transition and Retention Function of Summer Bridge Programs

Adulthood has developmental periods as does childhood. Havinghurst (1961) has indicated that the developmental phases in adulthood emerge as the adult prepares to assume societal roles, e.g. worker, parent, and citizen. One such phase is the 18-30 age group, in which individuals usually prepare to begin a career, choose a mate, start a family and align with an amicable social group. Knowles has proposed in his theory of adult learning, that as the individual matures, a psychological change toward self-directed learning occurs. This attitude of self-directedness is usually apparent during the first phase of adult development. Unlike the child who has a concept of dependency and passivity, the adult assumes responsibility for managing his or her own and life and learning.

However, readiness for self-direction varies among individuals and some must be oriented to this concept. As Knowles (1973) indicated,

It is by no means assumed that one has to sit passively by and wait for readiness to develop naturally. There are ways to stimulate it through exposure to better models of performance, higher levels of aspiration and self-diagnostic procedures. (p. 47)

Summer bridge programs have attempted to expose underprepared students to what Knowles described as "better models of performance" so that they can successfully complete their college studies. In order for students to place models of performance into context, they must first develop realistic perceptions about college education. The development of realistic student perceptions about college has been one of the foremost functions of summer bridge programs.

Counseling has been an integral component of summer bridge programs which addresses the student development aspect of college orientation. Neither counseling alone, nor academics alone have been found to be as effective as programs which integrate counseling, tutoring, instruction and career planning (Lauridsen, 1982; Maxwell, 1980). Lauridsen (1982) and others have reported that developmental education programs which emphasized affective development through

counseling as well as cognitive development through academic training, have been more successful than those which stress only one aspect of student development. In a NORCAL (Northern California Research Project on Student Retention) study on experimental retention programs in 11 community colleges, counseling programs were present in all which reported positive results (Macmillan, 1970; MacMillan & Kester, 1973).

Although trained in counseling psychology, or guidance, summer bridge program counselors have often assumed the role of both teacher and advisor. They provide study skills training, orientation, academic advising, career advising and personal counseling. At some institutions, they also train peer counselors who serve as role models and work with students during the summer and academic year. A staff which includes trained faculty who are sensitive to the psycho-social and pedagogical needs of underprepared students can further enhance the effectiveness of summer bridge programs (Harris, 1983).

This emphasis on personal adjustment is critical to the bridge program's retention function. Several researchers, among them, Tinto (1975, 1987) Lenning, Beal and Sauer (1980), and Pantages and Creedon (1978) have reported that the degree of congruence between the student and the institution is a chief determinant of retention. Vincent Tinto's (1975) theory is generally accepted as a reasonable explanation of this phenomenon. Tinto's theory of dropout behavior states that students arrive at college with a variety of attributes, pre-college experiences and family backgrounds which have an effect upon commitment to educational goals and to the institution. The strength of the individual's commitment to his or her educational goal and to the institution will determine whether he or she stays, or leaves the institution. Summer bridge programs have attempted to develop student commitment to the institution, and to specific personal educational goals.

Ten research studies pertaining to summer bridge program student performance were found. The findings indicate that retention is a major benefit of these programs. The bridge programs investigated ranged from programs of two weeks to eight weeks in duration. All were conducted for special admissions students (those who did not meet regular admissions standards) in four year colleges, both public and independent. Only two were reported for community colleges as was this study. Those community college studies were state reports of system-wide performance in New Jersey and New York (Bengis, 1984a; Smith, 1986).

Some of the programs reported test score gains of several grade levels (Arcuri, Daly & Mercado, 1982; Carmichael, 1982; Farrow, 1980; Fitts, 1979; Kling, 1972). One program reported no significant difference in academic performance (Williams, 1984). Others reported that bridge students were able to take college level courses the first semester, or were retained after one year (Bengis, 1984a, 1984b; Crist, 1980; Farrow, 1980; Fitts, 1979; Myers & Drevlow, 1982). This study sought to affirm the strong relationship between locus of control and achievement reported by other investigators and

to observe academic achievement resulting from summer program participation which provides an opportunity for change in locus of control.

Methodology

This investigation examined the benefits of summer bridge programs by comparing the locus of control and academic achievement, at the end of one semester, of two groups of college freshmen in the Educational Opportunity Fund Program in New Jersey. The Educational Opportunity Fund is a state supported academic and financial aid program for disadvantaged students with incomes below $12,000 annually, who are full-time matriculated students. Because of their low-socioeconomic status, there is a high probability that many EOF students are the first in their families to attend college. Black students comprised the largest proportion of the EOF population (49%), with Hispanics representing the second highest proportion (23%). Although there was a brief decline in Black student enrollment statewide from 1980 to 1985, the decline in the enrollment of Black students into the EOF program has slowed and stabilized. Data on Puerto Ricans was distinguished separately because of their predominance among the Hispanic population in the state.

The sample consisted of 155 randomly selected freshmen between the ages of 17 and 46 attending five selected community colleges. Black students represented the majority of subjects in the sample (52%) followed by White (25%), Puerto Rican (14%), Other Hispanic (6%) and Other Minority (3%) students. Most of the subjects were females (74%). The sample distribution by age, sex and ethnicity was close to that of the total EOF population and that of the community college sector. Fifty-five subjects were designated as "noncompleters" because they left the college before the end of the fall semester. The remaining one hundred "completers" were the primary subjects for the investigation.

The experimental group, which consisted of 41 completers, attended a six-week summer bridge program and were enrolled during the fall semester of 1985 at the five selected community colleges. The 59 completers in the control group did not attend the summer bridge program, but were enrolled at their respective colleges for the fall 1985 semester. All of the selected colleges were publicly supported two-year institutions located throughout the state. These colleges served both urban and suburban areas and served populations with high and low median income residents. The summer bridge program, which was the treatment for this study, featured remedial courses, college orientation, counseling and achievement motivation activities.

All subjects were pretested prior to the beginning of the summer bridge program with the New Jersey College Basic Skills Placement Test (NJCBSPT) and the Adult Form of the Nowicki-Strickland Internal-External Scale (ANSIE), a measure of locus of control. The subjects were administered the same measures at the end of one semester. The number of academic credits attained and the cumulative GPA were also used as measures of achievement. Age was the only demographic

characteristic entered in the statistical treatment. Analysis of covariance was used to examine the differences between groups. A significance level of .05 was selected before the study was conducted.

The Adult Form of the Nowicki-Strickland Internal-External Scale (ANSIE), developed by researchers at Emory University in Atlanta, consists of 40 items written at the fifth grade level which are answered either yes or no. The total number of external responses was counted to determine the extent of externality of the respondent, i.e. the higher the score, the more external the respondent's locus of control. The ANSIE was selected because it has been validated as a very acceptable measure of locus of control for adult and college populations (Nowicki & Duke, 1974; Dixon, McKee, & McRae, 1976; Hjelle, 1976). The ANSIE was published in 1973, and although derived from Rotter's (1954) scale based on his theory of social learning, the ANSIE is more consistent and less susceptible to socially desirable responses. Also unlike the Rotter, the ANSIE has a low reading level which makes it suitable for college as well as non-college populations (Joe, 1971; Lefcourt & Wine, 1969; Nowicki & Duke, 1974; Duke & Nowicki, 1974).

The New Jersey College Basic Skills Placement Test (NJCBSPT) is a three hour and twenty minute criterion referenced proficiency examination administered to all full and part-time freshmen after admission to New Jersey public and participating independent colleges and universities. The test was mandated by the State Board of Higher Education and was first administered in 1978. The test was developed by the Educational Testing Service under contract with the New Jersey Basic Skills Council, which oversees the testing program statewide.

The NJCBSPT has been found to be highly correlated with the Comparative Guidance and Placement Program (CGP) examination, the Test of Standard Written English (TSWE) and to a lesser degree with the SAT verbal and mathematics examinations. Studies by New Jersey colleges also indicate that the NJCBSPT is a reliable and valid measure of basic skills proficiency. A new form of the test is developed each year and statistically equated to previous forms. For this study, earlier forms of the NJCBSPT (1982, 1984) were used as posttests.

The NJCBSPT consisted of an essay and four sections written in multiple choice format: reading comprehension, sentence sense, mathematics computation, and elementary algebra. Essays were scored by a team of readers trained in the holistic method of essay scoring used by the test developer. The holistic method combines the ratings of two different readers; a third reader is required when there is a wide variation in the ratings of the first two readers. Results for both verbal and mathematics tests are reported as scaled scores ranging from 135-195. Students' scores are reported by the New Jersey Basic Skills Council as "proficient", "proficient in some areas", or "lacking proficiency."

Results

Major Findings

It was hypothesized that: (1) There would be a difference in the change of locus of control between EOF students who voluntarily participated in a summer bridge program and those who did not participate after one semester of study; (2) that there would be a difference in achievement of EOF summer bridge students compared to nonbridge students after one semester; and (3) that there would be a difference in locus of control at the time of admission of EOF students who completed one semester as compared to those who did not complete one semester. The influence of sex, ethnicity, and age were also examined although hypotheses were not proposed.

Although the analysis of covariance did not reveal significant differences between the bridge and nonbridge groups for change in locus of control, achievement in basic skills, and GPA, a significant difference ($p < .05$) was found with respect to credits earned after one semester. Among all ethnic groups, Black bridge students earned the highest number of mean credits. Male bridge students were the most academically successful in terms of credits earned and GPA. In addition, a comparison of gain scores demonstrated that bridge students increased their posttest scores significantly on the reading comprehension posttest and substantially on the essay and algebra posttests (see table 1).

The finding that bridge students achieved a greater number of mean credits than nonbridge students was heretofore unreported for studies of summer bridge programs. This suggests that the summer bridge treatment may motivate students to persist and complete the courses for which they are enrolled. This supports other research (Drucker, 1982; Farrow, 1980; Myers & Drevlow, 1982) which indicates that summer bridge students are more inclined than nonbridge students to take advantage of support services (e.g. tutoring and counseling) that are provided by the college during the academic year. Summer bridge participation evidently had a positive influence on student persistence.

With respect to locus of control, an interesting pattern of change was observed. Initially both the bridge and nonbridge groups showed a tendency toward personal (internal) control. However the majority (92%) of bridge students became significantly ($p < .05$) more internal (felt in control of their environment) than the nonbridge students after one semester. In fact, after one semester, the majority of nonbridge students (58%) shifted to a less internal orientation, indicating a lack of belief in personal control over their environment.

Other Findings

Because of the wide range of ages represented in the sample, comparisons of achievement and locus of control were made for the age categories 17-19, 20-24, 25-30 and 31 and above. Younger adults (aged 17-19) performed better than older adults (aged 25 and above) on the NJCBSPT mathematics tests for computation and algebra; a

Table 1

Growth Differential for Bridge and Nonbridge Students on NJCBSPT and Locus of Control

	Difference Score Pretest v. Posttest for Bridge (N=41)	Difference Score Pretest v. Posttest for Nonbridge (N=59)	Difference Between Pre/Post	In Favor of:
Reading Comprehension	7.853	4.492	+3.361	Bridge
Sentence Sense	2.560	3.000	-0.450	Nonbridge
Essay	1.049	0.076	+0.973	Bridge
Math Computation	3.976	3.526	+0.045	Bridge
Algebra	2.269	2.153	+0.116	Bridge
Total English	4.952	5.322	-0.370	Nonbridge
Locus of Control	Positive Direction	Negative Direction		

statistically significant finding [F=(3,1)=61.22, p<.0001]. This confirms previous research (Frederick, et al., 1984) on age differences which indicates that adults aged 25 and above tend to perform inadequately on mathematics tests because of lack of opportunity to practice those skills. On the other hand, older adults (aged 25 and above) in this study generally exceeded younger adults in credits attained and GPA regardless of bridge category.

Among all age groups, the oldest adults aged 31 and above in the bridge group had the greatest inclination toward personal control as evidenced by their internal scores on both the ANSIE pretest and the posttest. However, their nonbridge counterparts were less internal on the posttest. These findings may suggest that older entering community college students may need just as much orientation and assistance offered by summer bridge programs as younger students in order to keep their confidence in an unfamiliar environment.

Although females were the majority of subjects, they tended to exhibit a less internal locus of control than males. The pattern observed in this study is similar to several researchers (Hochriech, 1974; Prociuk & Breen, 1975) who have reported that females have a tendency to be defensive externals--achievers who consciously respond in a socially acceptable manner so that they do not appear to be competitive or ambitious. This result was not statistically significant and the phenomenon requires further study.

The five ethnic groups compared were, in order of relative proportion, Black, White, Puerto Rican, Other Hispanic and Other Minority (which included American Indians and Asians). Most ethnic groups performed at a higher level on verbal sections of the NJCBSPT than on the mathematics and algebra sections. Black bridge students earned a greater number of mean credits (M=11) than Black nonbridge students (M=6.9); however, Black bridge and nonbridge students did not differ notably on GPA attained after one semester.

Black bridge students earned fewer of the credits attempted and had low course grades; in comparison, Puerto Rican bridge students attempted the minimum number of credits necessary and earned all of the credits attempted. An examination of the credits attempted by both groups indicated that a higher proportion of Black bridge students enrolled for more credits over the standard 12 credits required for a full course load. This contrast of high credit accumulation with low GPAs by Black students could suggest the need for guidance and monitoring of Black students who have higher than average course loads in order to help them succeed in their courses and avoid probation or academic dismissal.

Bridge students of all ethnic groups except Other Hispanics and Other Minorities demonstrated internal locus of control scores initially and increased their internal orientation by the end of the fall semester. However, at the end of one semester only Black and Other Minority nonbridge students continued to show that tendency. Unfortunately when differences between ethnic groups were compared, those differences were not large enough to produce statistically significant results.

Implications of the Study and Recommendations

The most important implication of this study is that summer bridge program participation appears to facilitate persistence and achievement, that is, summer bridge students can be motivated to remain enrolled and complete their coursework sufficiently well. This was demonstrated by the significant relationship found between the summer bridge participation and earned credits, the marked improvement in the posttest performance of bridge students, and the significant tendency toward personal (internal) control demonstrated by bridge group students of all age categories at the end of one semester.

These behaviors may be due to the achievement motivation aspects of the summer bridge program that were designed to help students become more self-directed and to improve their study habits. The confidence that students gain through participation in the summer bridge program may extend into the academic year.

This study also showed that bridge students generally, and Black bridge students particularly, earned the greatest number of mean credits. Thus, the summer bridge experience may have had a significant impact on the attitudes which disadvantaged Black students had regarding their ability to attain their educational goals during the first semester.

There are, of course, some limitations to the interpretation of these findings. First, there are other factors besides locus of control which could affect student achievement. There are also other factors which could compel community college students to voluntarily attend a summer bridge program, decline to attend a summer bridge program, or to drop out of college. For example, family responsibilities and employment needs will equally impact upon both bridge and nonbridge students and can affect their persistence and retention.

Second, one semester is probably not sufficient time for community college students to improve writing and algebra skills--two tested areas where scores were particularly weak in this study. Students would certainly need more time for instruction if their exposure to the subject matter was limited or nonexistent prior to enrollment.

Third, this study was conducted on a community college population in one state, which may or may not be representative of two year institutions in other states. Finally, although they share similar goals, summer bridge programs can be unique in staff and approaches. Achievement motivation techniques, if utilized, may vary from program to program. Because of their shared experiences through in-state networking, attending training workshops, attending seminars and receiving similar consultative services, the EOF programs in New Jersey may have achieved somewhat standardized approaches to achievement motivation which may not be evident in other parts of the country. Thus, these results could be a reflection of those shared experiences.

Despite its limitations, this study provides insights for those responsible for coordination of freshmen year activities, student retention, enrollment management and academic assessment. The following recommendations are offered in light of the findings of this study.

Recommendation 1

The summer bridge program should definitely be retained as an intervention to improve the retention of Black and other minority disadvantaged students in the community college. This study established that summer bridge students can earn more credits toward graduation and maintain a satisfactory grade point average during the first semester Where possible, the summer bridge experience, in some form, should be a mandatory requirement for community college freshmen.

Summer bridge students in this study experienced significant growth, in comparison to nonbridge students, in reading comprehension, a very necessary prerequisite to college study. Bridge students also showed improvement in algebra which is an increasingly important gateway to the higher levels of mathematics considered necessary for technological and scientific occupations. Summer bridge participation may also be a significant factor in student retention as has been demonstrated in a study (Smith, 1986) of Black EOF undergraduates which indicated that a greater proportion of community college summer bridge students were retained than nonbridge students over a two semester period. The results of the present study strongly suggests that the summer bridge concept should be supported in community colleges whether it is an intensive program during the academic year, or conducted during the summer months.

Recommendation 2

To improve the chances of success for returning adults and first time freshmen who cannot attend the summer bridge program, special achievement motivation workshops, college orientation and study skills seminars should be conducted as evening and weekend programs which may be more convenient for students with parental, or job responsibilities.

Older adults (aged 25 and above) need a summer bridge experience as well as younger adults, but because of family obligations or job requirements, many older adults may elect not to attend the traditional summer bridge program. The summer bridge concept can be extended to the academic year as a prerequisite to collegiate programs of study so as to provide an intense orientation to the demands of the academic environment.

Recommendation 3

Black students who have had the experience of a summer bridge program may become ambitious or confident enough to take the maximum number of credits permitted. However, they will need to be carefully guided so as not to lose this advantage so that they can complete their courses successfully .

This study showed that although Black students, who represented 52% of the sample, earned the greatest number of mean credits, they did not achieve the high mean GPAs demonstrated by Puerto Rican students, who represented only 14% of the sample. Unlike the Puerto Rican students, the Black students attempted more credits, but passed a smaller proportion of the courses for which they were enrolled. This indicates the need for careful assessment before bridge participants begin the term and follow-up to keep them on track while supporting their internal (self-supporting) behavior.

Recommendation 4

Because of the diversity of students who are admitted to open access institutions, there should be a thorough assessment, or what Herrsher (1973) has termed "preassessment", of entering students' academic backgrounds to provide appropriate advisement and where necessary, remediation. A locus of control measure should be included in that assessment whether or not standardized tests are used.

Roueche (1980), a foremost authority on the community college sector, supports the concept of preassessment and has defined it as an examination process designed to determine each student's reading level, study skills ability and success orientation. Indeed there is a growing body of literature on assessment in the two-year college sector (Palmer, 1987). In addition to basic skills preassessment, which most colleges practice, and locus of control assessment, which is recommended here, a comprehensive review of students' past educational experiences which relate to basic skills proficiency should be conducted. For example, for mathematics course placement, a questionnaire could be designed around variables suggested by Frederick, et al. (1984) regarding the number of high school mathematics courses completed, length of time since the last mathematics course, and amount of daily experience using mathematics. For older adults especially, the results of such an assessment can be used to determine whether students could benefit from a brief refresher course or a year long remedial course. Other types of assessment, such as value-added assessment which measures the degree of improvement and its relationship to instruction (Belcher, 1987) should also be explored.

Recommendation 5

Faculty should develop alternative teaching styles which improve the level of performance of females and minorities in mathematics. Efforts should be made to eliminate false and negative notions about mathematics and to develop effective approaches for learning mathematics.

The subjects in this sample, who were primarily female and Black American, demonstrated less improvement in algebra than in any other area posttested by the NJCBSPT. This profile for mathematics in general has been cited as a national phenomenon and should be of concern to educators of all academic levels. It has been shown that females can improve their mathematics proficiency after remediation (Porter, 1986); the same can be expected of minorities if given

appropriate instruction. Attention to instructional outcomes at the college level can decrease the number of minorities and females who might be excluded from majors which require mathematics proficiency.

Future Areas for Research

The substantial differences in locus of control, basic skills achievement, and earned credits after one semester demonstrated by the bridge students and nonbridge students in this study suggest the need for longitudinal studies of summer bridge participants. Among the areas of inquiry which should be considered are:

o To examine whether a given locus of control tendency is maintained by bridge students throughout their college careers.

o To examine the influence of locus of control on achievement and career aspirations of Black students.

o To ascertain tendencies in locus of control among achieving and nonachieving females.

o To ascertain whether bridge students maintain an academic advantage over nonbridge students over several academic terms.

o To analyze the role of the counselor and the impact of the amount of counseling on locus of control--especially among nonbridge participants who were admitted with stronger academic proficiencies than their bridge counterparts, yet became less confident of their abilities (displayed a tendency toward external control) later in the academic term.

Conclusion

College attrition studies indicate minority students enter college with high aspirations, yet they leave in greater numbers than majority students. Interventions such as summer bridge programs and counseling for internal locus of control can provide the assistance Black and other minority students need to adjust to the college environment and to remain within the institution.

This study identified a statistically significant relationship between summer bridge participation and the earning of credits toward graduation. It also reported that summer bridge participants achieved significantly higher basic skills gain scores, on average, than nonbridge students. Finally, the majority of bridge students in all age categories represented in the sample shifted to a more internal locus of control by the end of one semester. Although initially nonbridge students demonstrated an internal tendency, they shifted to a more external orientation by the end of one semester as measured by the Adult Nowicki-Strickland Internal-External Scale. These results suggest that the locus of control training experiences provided in the summer bridge program could have had some effect on students' attitudes and improved their confidence in their ability to successfully attain their academic goals that semester.

Student development specialists, faculty, and administrators who conduct motivational programs for college students, or the college-bound may wish to use locus of control assessment in conjunction with other achievement predictors and to observe the locus of control pattern of community college students over time to determine which students will need special attention in order to develop to their fullest potential.

For the foreseeable future, two-year community colleges will continue to provide the first years of postsecondary education to increasing numbers of minority students and, as such, bear the awesome responsibility of educating a growing segment of the American population--Black Americans and Hispanics. Both Black and Hispanic workers will have to meet the needs of an American business economy increasingly based upon technology, information and skilled services. Therefore it is vitally important that community colleges assess students' skills at entry, provide appropriate interventions and apply instructional strategies that will educate and retain the minority students who will assume those occupations in the year 2000 and beyond.

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